

forming a cathode above the light-emitting layer by laminating a first cathode, formed of a material having a work function of 3.0 eV or less, and a second cathode, formed of a material having a work function higher than that of the first cathode, in this order so that a total thickness of the first and the second cathodes is 100 angstroms or less.

10. (Amended) The method for manufacturing an organic electroluminescent device according to Claim 9, the step of forming the anode further includes performing at least one of an oxygen and an air plasma treatment after an electrode film is formed, and setting a current  $x$  and a time  $t$  in the treatment, such that  $10 \text{ (mA)} \leq x \leq 15 \text{ (mA)}$  and  $5 \text{ (minute)} \leq t \leq 7 \text{ (minute)}$ .

11. (Amended) The method for manufacturing an organic electroluminescent device according to Claim 9, the step of forming the anode further includes performing at least one of an oxygen and an air plasma treatment after an electrode film is formed, and setting a current  $x$  and a time  $t$  in the treatment, such that  $10 \text{ (mA)} \leq x \leq 12 \text{ (mA)}$  and  $t = 5 \text{ (minute)}$ .

---

#### REMARKS

Claims 1-11 are pending. By this Supplemental Preliminary Amendment, claims 1-11 are amended, the specification is replaced with a Substitute Specification, and the Abstract is replaced with a substitute Abstract. No new matter is added.

Prompt and favorable examination on the merits is respectfully requested.

The attached Appendix includes marked-up copies of the specification (37 C.F.R. §1.125(b)(2)) and each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

In view of the foregoing amendments and remarks, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

Eric D. Morehouse  
Registration No. 38,565

JAO:EDM/gam

Attachments:

Substitute Abstract  
Appendix  
Substitute Specification  
Marked-up copy of specification

Date: October 5, 2001

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

<p><b>DEPOSIT ACCOUNT USE AUTHORIZATION</b> Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
---



RECEIVED

JUN 24 2002

ABSTRACT OF DISCLOSURE

TECH CENTER 1600/2900

An organic electroluminescent device includes an anode, a light-emitting layer, and a cathode, which has a structure formed by sequentially laminating, from the light-emitting layer side, a first cathode formed of a material having a work function of 3.0 eV or less, and a second cathode, formed of a material having a work function higher than that of the first cathode, so that the total thickness of the first and the second cathodes is 100 angstroms or less. These elements are stacked on a substrate, and light is emitted to an exterior of the device via at least the cathode.



## APPENDIX

RECEIVED

JUN 24 2002

## Changes to Abstract:

The following is a marked-up version of the amended Abstract.

TECH CENTER 1600/2900

ABSTRACT OF DISCLOSURE~~Abstract of Disclosure~~

An organic electroluminescent device includes a~~An anode-~~, a light-emitting layer, and a cathode, which has a structure formed by sequentially laminating, from the light-emitting layer side, a first cathode ~~formed~~~~composed~~ of a material having a work function of 3.0 eV or less, and a second cathode, ~~formed~~~~composed~~ of a material having a work function higher than that of the first cathode, so that the total thickness of the first and the second cathodes is 100 angstroms or less. These elements are stacked on a substrate~~-1~~, and light is emitted to an exterior of the device~~the outside~~ via at least the cathode.

## Changes to Specification:

A Substitute Specification is attached in accordance with 37 C.F.R. 1.125(b)(2).

## Changes to Claims:

1. ~~{Claim 1}~~(Amended) An organic electroluminescent device, comprising:  
a substrate;  
an anode;  
a light-emitting layer ~~formed~~~~composed~~ of an organic material; and  
a cathode ~~including having a structure in which~~ a first cathode ~~formed~~~~composed~~ of a material having a work function of 3.0 eV or less and a second cathode ~~formed~~~~composed~~ of a material having a work function higher than the work function~~that~~ of the first cathode, the first and second cathodes being~~are~~ sequentially stacked in this order  
from the side of~~from the light-emitting layer side, the anode~~~~are stacked on a substrate, at the~~  
total thickness of the first and the second cathodes being 100 angstroms or less, and light ~~being~~is emitted to an exterior of the device~~the outside~~ via at least the cathode.

\_\_\_\_\_ 2. \_\_\_\_\_ (Amended) ~~[Claim 2]~~. ~~The~~An organic electroluminescent device according to Claim 1, ~~the device at~~~~wherein~~ the cathode ~~being~~~~side~~ is sealed by a sealing layer ~~formed~~~~composed~~ of a light transmissive material.

\_\_\_\_\_ 3. \_\_\_\_\_ (Amended) ~~[Claim 3]~~ ~~The~~An organic electroluminescent device according to Claim 1, ~~wherein~~ the first cathode ~~including~~~~comprises~~ Ca.

\_\_\_\_\_ 4. \_\_\_\_\_ (Amended) ~~[Claim 4]~~ ~~The~~An organic electroluminescent device according to Claim 1, ~~a~~~~wherein~~ the thickness y (angstrom) of the first cathode ~~being~~~~is~~ such that  $50 \leq y \leq 80$  ~~holds~~.

\_\_\_\_\_ 5. \_\_\_\_\_ (Amended) ~~[Claim 5]~~ ~~The~~An organic electroluminescent device according to Claim 1, ~~a~~~~wherein~~ the thickness y (angstrom) of the first cathode ~~being~~~~is~~ such that  $55 \leq y \leq 65$  ~~holds~~.

\_\_\_\_\_ 6. \_\_\_\_\_ (Amended) ~~[Claim 6]~~ ~~The~~An organic electroluminescent device according to Claim 1, ~~wherein~~ the second cathode ~~including~~~~comprises~~ Al.

\_\_\_\_\_ 7. \_\_\_\_\_ (Amended) ~~[Claim 7]~~ ~~The~~An organic electroluminescent device according to Claim 1, ~~a~~~~wherein~~ the thickness z (angstrom) of the second cathode ~~being~~~~is~~ such that  $10 \leq z \leq 20$  ~~holds~~.

8. (Twice Amended) ~~The~~An organic electroluminescent device according to Claim 1, ~~wherein~~ the organic material forming the light-emitting layer ~~being~~~~is~~ a polymeric material.

\_\_\_\_\_ 9. \_\_\_\_\_ (Amended) ~~[Claim 9]~~ A method for manufacturing an organic electroluminescent device, comprising:

\_\_\_\_\_ ~~a step of~~ forming an anode on a substrate;

\_\_\_\_\_ ~~a step of~~ forming a light-emitting layer ~~formed~~~~composed~~ of an organic material above the anode; and

~~\_\_\_\_\_ a step of forming a cathode above the light-emitting layer by laminating a first cathode, formed ~~composed~~ of a material having a work function of 3.0 eV or less, and a second cathode, formed ~~composed~~ of a material having a work function higher than that of the first cathode, in this order from the light-emitting layer side so that the total thickness of the first and the second cathodes is 100 angstroms or less.~~

~~\_\_\_\_\_ 10. (Amended) [Claim 10] The~~A method for manufacturing an organic electroluminescent device according to Claim 9, ~~wherein~~ the step of forming the anode further ~~includes~~ comprises a step of performing at least one of an oxygen and an air plasma treatment after an electrode film is formed, and setting a current x and a time t in the treatment, ~~are set~~ such that  $10 \text{ (mA)} \leq x \leq 15 \text{ (mA)}$  and  $5 \text{ (minute)} \leq t \leq 7 \text{ (minute)}$  ~~hold~~.

~~\_\_\_\_\_ 11. (Amended) [Claim 11] The~~A method for manufacturing an organic electroluminescent device according to Claim 9, ~~wherein~~ the step of forming the anode further ~~includes~~ comprises a step of performing at least one of an oxygen and an air plasma treatment after an electrode film is formed, and setting a current x and a time t in the treatment, ~~are set~~ such that  $10 \text{ (mA)} \leq x \leq 12 \text{ (mA)}$  and  $t = 5 \text{ (minute)}$  ~~hold~~.